

REMARKS

Claims 2 through 4, 8 through 12, 14 through 20 and 22 remain pending in the application with the present amendments. In the Office Action, all claims were rejected under 35 U.S.C. §102 as being anticipated by U.S. Patent Publication No. 2003/0001252 to Ku et al. ("Ku"), or rejected under 35 U.S.C. §103 as being obvious over various combinations of references, as indicated in the Office Action. For the following reasons applicants submit that the claims as amended herein are fully distinguished from the references used in the Office Action to reject the claims.

The invention recited in the presently pending claims resolves a problem of dissipating heat from a multiple-chip package to a circuit panel. As amended herein, independent claim 2 recites an assembly which includes first and second chips and a chip carrier having terminals connected to at least one of the chips. The chip carrier includes an opening that coincides with at least a portion of the rear surface of the second chip. Thermal communication between the rear surface of the second chip and a circuit panel is provided through a flowable conductive material which connects the rear surface to a mounting surface of a thermally conductive element of the circuit panel, the flowable conductive material *spacing* the rear surface from the mounting surface.

Applicants submit that these features recited in the presently pending claims are neither taught nor suggested by the cited references. Ku (FIGS. 4A through 5B) merely illustrates a chip attached to a "chip mounting plate 10" of a package, not a circuit panel.

Ho, (U.S. Patent No. 6,657,296) merely illustrates a packaged chip on which a rear surface of the chip is mounted to a "die attach region" 202. The die attach region 202, in turn, is thermally connected to a "thermal pad" 22 by way of "thermal

vias 205". As further illustrated in FIG. 5, the thermal pad (52) may be further connected to a heat sink 581 in a circuit board by way of solder paste 580. Clearly, the combination of *Ku* and *Ho* neither teaches nor suggests the invention as recited in claim 1. *Ho* fails to teach or suggest a flowable conductive medium which connects and spaces the rear surface of a chip from a mounting surface of a thermally conductive element of the circuit panel. *Ho* has much other structure between the chip and the heat sink of the circuit panel. This may result in a lower flow of heat between the two than by using the invention as recited in claim 1.

Moreover, none of the other cited references, either alone or in combination, teach or suggest the features of the invention recited in claim 2. Hofstee et al. (U.S. Patent Publication No. 2002/0074668) merely illustrates a multi-chip package 200 (FIG. 2) which includes a heat spreader 220, the heat spreader being separated from the chips of the module by both vertical thermally conductive elements 226 and two layers of lateral thermally conductive elements 224, 228. In addition, in Tsai et al. (U.S. Patent Publication No. 2004/0041249) the chip package includes a thin copper plate 27 sandwiched between two layers of adhesive 26, 52, one of which (26) attaches the plate to a lower surface 14 of the package substrate 12. Again, this structure does not meet the language of a *flowable conductive material spacing* the rear surface from the mounting surface of a thermally conductive element *of the circuit panel*.

Support for the present amendments is provided, *inter alia*, at paragraphs [0070] through [0080] of the Specification and FIGS. 17-18.

As it is believed that all of the rejections set forth in the Official Action have been fully met, favorable reconsideration and allowance are earnestly solicited.

If, however, for any reason the Examiner does not believe that such action can be taken at this time, it is respectfully requested that he telephone applicant's attorney at (908) 654-5000 in order to overcome any additional objections which he might have.

If there are any additional charges in connection with this requested amendment, the Examiner is authorized to charge Deposit Account No. 12-1095 therefor.

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Respectfully submitted,

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